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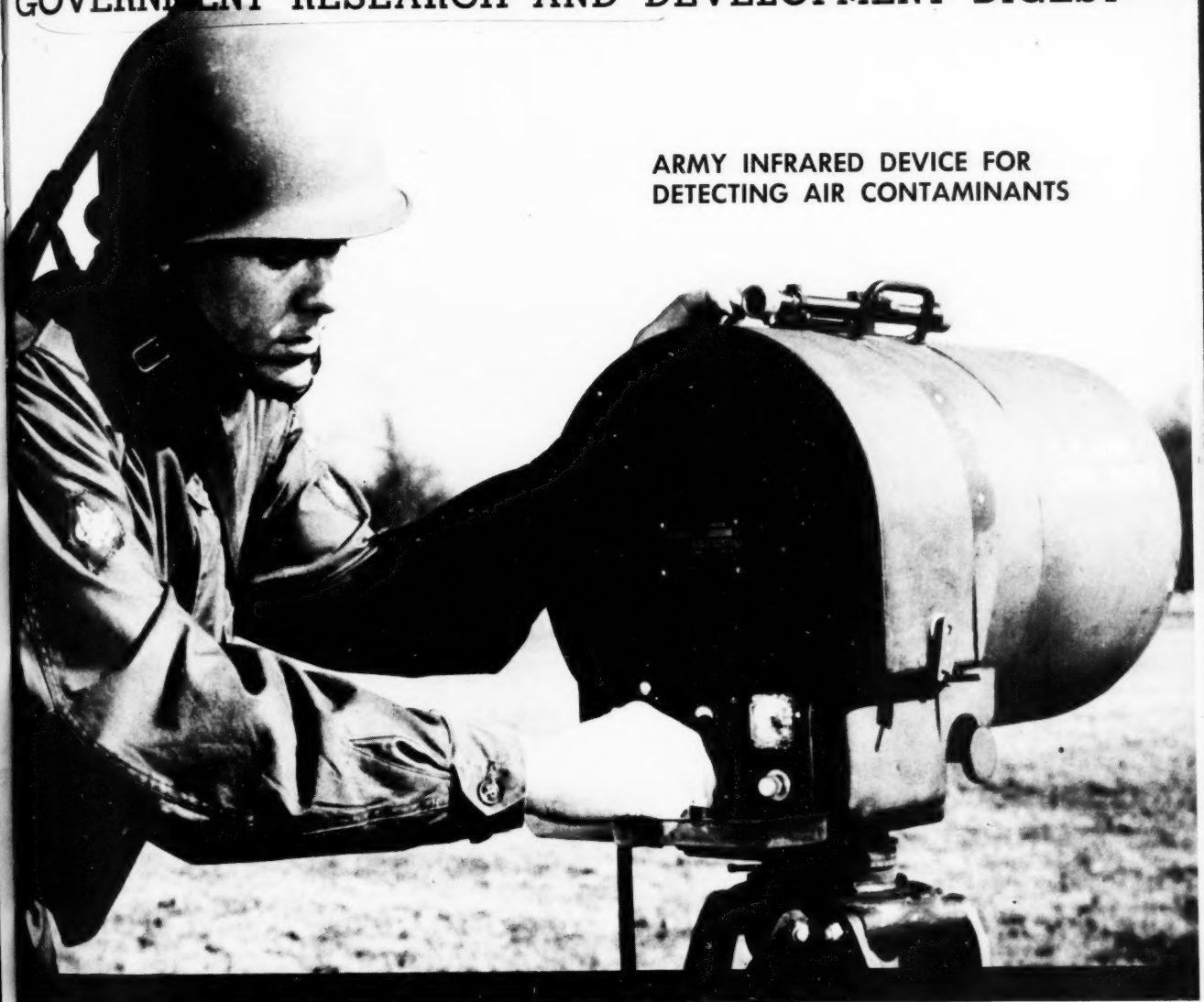
FOR THE GOVERNMENT CONTRACTOR

GOVERNMENT RESEARCH AND DEVELOPMENT DIGEST



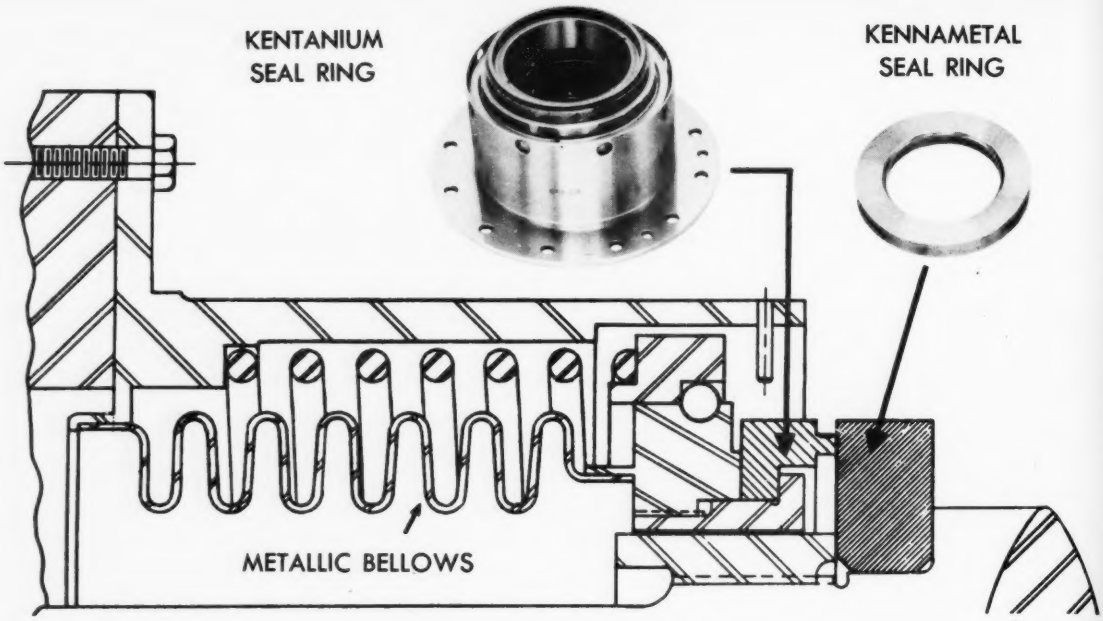
ARMY INFRARED DEVICE FOR DETECTING AIR CONTAMINANTS

IN THIS ISSUE:

SPECIAL REPORT

ARMY ENGINEERING RESEARCH AND DEVELOPMENT LABORATORIES

FORT BELVOIR, VIRGINIA



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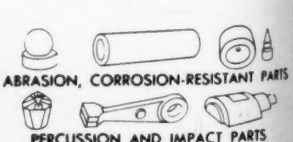

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Volume 3 Number 5

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MAY 1958

. . . new developments in

Air & Space 22
Communications/Electronics 24
Construction 26
Energy 27
Logistics/Materials 28
Ordnance 29

OUR COVER

Infrared device for detecting air contaminants as far as one quarter of a mile away has been developed by Army Chemical Corps and Farrand Optical Co. of New York. Known as LOPAIR (Long Path Infra Red), system has self-aligning unit which returns infrared beam to detector head.

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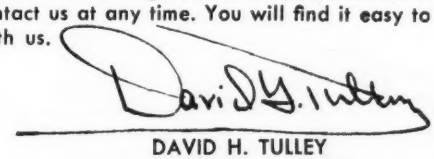
ERDL

SPECIAL MESSAGE TO DATA READERS:

How to improve the mobility of the Pentomic Army is one of the major problems confronting the U. S. Army Corps of Engineers. If we are to solve it, and to fulfill our role in the nation's defense, scientific "breakthroughs" are not only desired, but required.

The Corps' Research and Development Laboratories appreciate this opportunity to tell the story of Engineer accomplishments and requirements. Through DATA we are able to reach the people whose ingenuity is sure to be an ingredient of success on a future battlefield.

I encourage those working in basic research areas to discuss their ideas with our engineers and scientists. Please feel free to contact us at any time. You will find it easy to do business with us.



DAVID H. TULLEY
Major General, USA
Commanding General
USAERDL

Major Gen. David H. Tulley, USA, assumed command of the Engineer Center at Fort Belvoir in May, 1956.

Born in Durango, Colorado, April 17, 1904, he has served in the Corps of Engineers since 1925. His assignments have included duty with the Third Engineers, in Hawaii; the National Recovery Administration; the Panama Canal Zone; the European Theatre and Postwar Projects Branch; Joint Task Force Seven, Eniwetok; and as Chief of the Engineer Division, U. S. Army in Europe. He holds many commendations.

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Fort Belvoir, Virginia

SOUTH 5-7700

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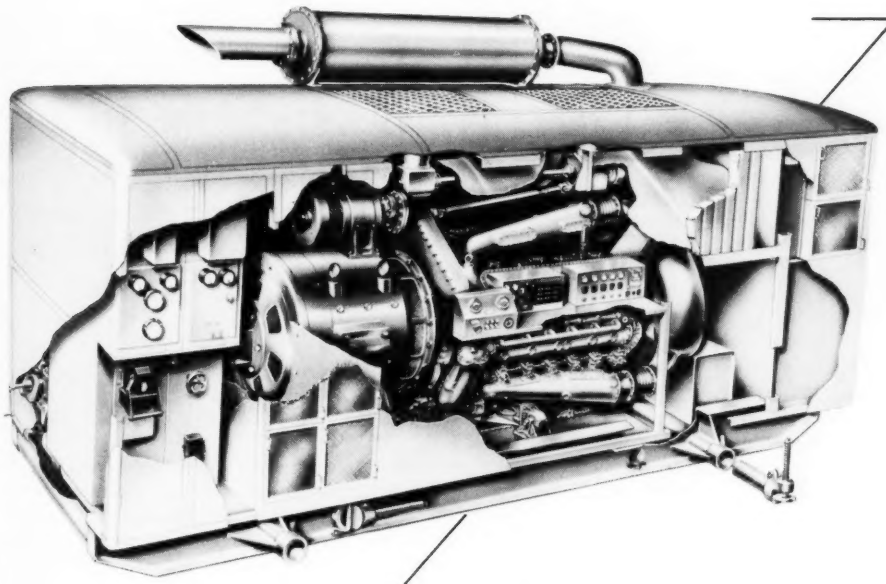

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AT FORT BELVOIR

The NAPIER DELTIC COMPRESSOR currently under test and scheduled for installation at Fort Belvoir will be used as an air source. As a portable or mobile LOX (liquid oxygen) plant, the NAPIER DELTIC will be capable of 20 tons per day.

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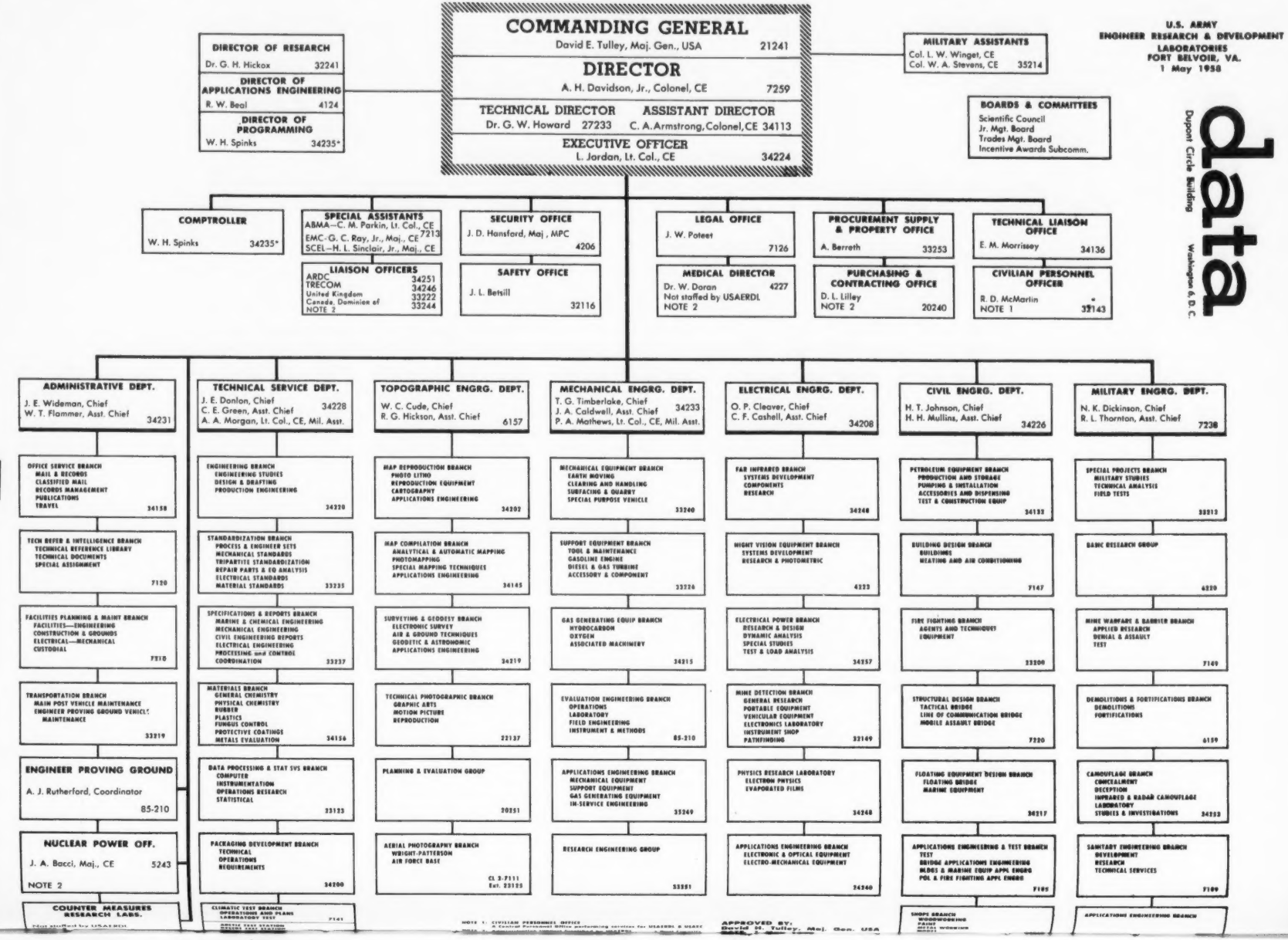

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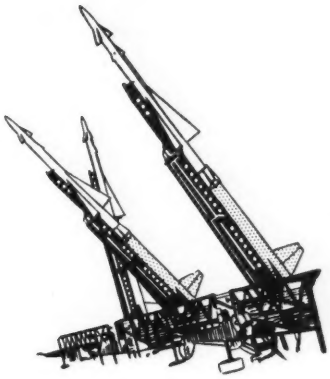

HOW TO DO BUSINESS WITH ERDL

The following information on contractural procedures may be of assistance to DATA readers interested in doing business with the Army R. & D. Laboratories.

Research and development contracts are consummated by negotiation, such negotation being conducted with the firms or organizations possessing the qualifications required for the particular project. The project may be one assigned at the Department of Army level or by the Technical Committee of the Office of the Chief of Engineers, U. S. Army. It may originate within the technical departments of ERDL. Each project has a definite aim, and while some basic research is sought, applied research is the principal goal.

The demands for contractural services are in the broad fields of Mechanical, Civil, Electrical, Topographic and Military Engineering. The range of research and development by the Labs' technical departments is necessarily broad and includes, in part: earth-moving equipment of all types, cranes, ditch-diggers, tractors, snow-plows, special purpose vehicles, vans and trailers, internal combustion and diesel engines, generators, engine-generator sets, demolition and obstacle equipment, mine-laying and mine-warfare items, searchlights, night vision and infrared equipment, pre-fabricated buildings, sanitation and water purification equipment, all types of surveying, map compilation and reproduction equipment, fixed and floating bridges, and pipe-line and petroleum handling equipment, to mention but a few. In addition, research is active on many classified projects, which require the tightest control and supervision both during the negotiation stage and throughout performance of the contract.

The negotiation procedure begins when the technical branch concerned requests the Purchasing and Contracting Office to initiate action to execute a contract for a specific project. Project cost estimates are prepared; program schedule approval is assured; a statement of the desired work and services is drafted; bidders lists are determined, and an invitation to submit a proposal is mailed the prospective bidders. A reasonable period of time is allowed in which to prepare a responsive bid. The Government's invitation queries as to the makeup of the organization of the bidder, the experience he has had in the field concerned, his technical qualifications, facility and financial status, ther Government contracts he possesses, his ability to meet delivery schedules, the type of contract he prefers, manner of paymnt, whether he has or not employed a person, or firm, other than full-time employees of his own organization to solicit or secure the proposed contract, and assurance that he fully understands the complexities of the project and that he is willing to undertake them. In addition, a detailed cost breakdown must accompany the bidder's signed proposal.

Proposals received are subjected to a thorough examination and analysis. Material and labor costs are studied, engineering hours are evaluated, overhead rates, (factory, engineering and drafting) are compared with existing data, sub-contracting costs receive attention, together with such cost items as special tooling, consultants, travel, etc.

If the bidder(s) in the zone of consideration have had no recent Government contracts a field visit to perform a pre-qualification check or survey is undertaken. Additional justification to support material or other costs may be required. Every reasonable and prudent effort is made to assure that the successful contractor thoroughly understands the scope of the contemplated procurement, and that he is qualified in every respect to perform.

It is the announced policy of the Department of Defense that no obstacles be placed in the way of broadening the procurement base. Commercial organizations desiring to participate in Government procurement are encouraged to request that they be included in bidders' lists. Inquiries from such firms will be given prompt and courteous attention, and advice furnished as to the data required to place their names on lists to receive future proposals in the areas for which they are deemed to be qualified.

PROCUREMENT OFFICERS

ARMY ENGINEERING RESEARCH AND DEVELOPMENT LABORATORIES, FT. BELVOIR
SOUTH 5-7700

PURCHASING & CONTRACTING OFFICE

D. L. Lilley, Chief —20240

R. H. Matthews, Ass't Chief—29280

A. R. Purcell, Adm. Ass't —20240

CONTRACTS BRANCH BLDG 314

R. H. Matthews 29280

UNIT A ROOM A-255

A. K. McDonald 34123

UNIT B ROOM A-221

J. Kees 28253

UNIT C ROOM A-217

A. W. Crickenberger 4255

R. O. Sanford 4255
Small Business Specialist

CONT. ADM. & TERM.

R. A. Payne 6210

REP. & ADM.

Lucy B. Cooney 5180

PURCHASE BRANCH BLDG F-26

K. E. McLaughlin 23253

UNIT A

W. C. Cobbs 4233

UNIT B

V. H. Grahs 27242

CONTRACT

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SPECIAL NEWS FEATURE IN *data*

NEW MACH 4 BOMBER PLANNED

Data has learned one of the biggest projects in the works of the Air Force is the weapons system to replace the North American B-70. (WS-110)

B-70 is a chemically fueled manned bomber designed for target area speeds of about 2000 mph. *It isn't even close to flying status, but already is found to be obsolete in light of USSR missile progress.* Russians are concentrating on unmanned weapons. U. S. will continue putting large amount of faith in manned bomber systems that can change course at last minute near target areas to seek out and destroy enemy launching sites of mobile or transitory nature.

2000 MPH Too Slow

Already AF Pentagon planners find 2000 mph is too slow to strike retaliatory blow against enemy. New proposal is for Mach 4 (appx. 3000 mph.) weapons system of intercontinental range, operational at altitudes up to 100,000 feet. New bomber will be manned system because no substitute has been found for pilot in making decisions in target area, and Pentagon top brass in E-ring say enemy would keep missile launching sites both spread out and moving. Hence, pilot needed for long time to come.

Point to note is that manned bombers extending beyond even the Mach 4 ramjet-powered bomber discussed above are under active development. These are so called "Hypsonic Skip-Gliders" that extend range by leaving atmospheric limits and skim and skip on thin layers of air like flat stones on water during process of re-entry.

Curtiss Wright Benefits

One of the major benefactors of the Mach 4 ramjet bomber will be the Wright Aeronautical Division of Curtiss Wright. When the SM-64 and 64A (NAVAHO) programs fell by the wayside (after an expenditure of $690 million), Curtiss Wright, like NAA was left holding the proverbial bag.

Pioneering in a new field of performance, Curtiss Wright had developed most powerful ramjet powerplant system in the world. With the NAVAHO scheduled for mass production, C-W had in its hands a tremendous contract, desperately needed by a company which revealed its shaky position in the dismissal of thousands of employees when NAVAHO was dropped.

Now suddenly there looms on the horizons a shining new development and production future in the Mach 4 ramjet bomber. It's a cinch that North American is slated to play a predominant role in the new bomber's airframe, and it looks awfully good from here for Curtiss Wright to get the new bomber's powerplant contract.

North American Picture Good

NAA, which recently beat out Boeing on the B-70, and also walked off with the tremendous prestige attached to the space-probing X-15 program, will very probably soon net a fat contract with the F-108 strategic fighter in addition to getting the nod on the new Mach 4 ramjet.

And by the way, at this moment there are seven NAA NAVAHO test vehicles in moth balls which are slated to be dusted off and transplanted to Cape Canaveral as test equipment in AF's new program of "Research in Supersonic Environment."

Making the picture even brighter for North American is the fact that the new manned ramjet bomber also means continued limited production of the three-barreled NAVAHO booster, which, with its 405,000 pounds of thrust, is the most powerful one of its kind in the free world.

Promising to extend the longevity of the NAVAHO booster is the new program for manned space flight evolving from the X-15 hypersonic aircraft. Current AF program calls for at least one of the three X-15s being built to be mated with a NAVAHO booster . . . and what a ride that will be! This combo will send the X-15 into orbit about the earth at 18,000 mph., if all goes well. Current AF selection for pilot of this "NAVEX-15" vehicle is Capt. Ivan Kinchloe, Jr.

In its contract awards for the X-15 program, USAF selected NAA for the airframe contract but assigned motor development to Reaction Motors, Inc. of New Jersey. RMI is backed up against the wall with the teething problems encountered with the 60,000-pound thrust motor. NAA officials make no bones over the fact that they feel their own Rocketdyne division could long ago have provided an adequate powerplant.

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WHAT ERDL DOES

Left. Liquid oxygen is pumped into REDSTONE missile.

Above. H-21 Vertol helicopter delivers raft to construction site.

DATA presents to its readers a brief story of ERDL efforts to support the Army in a new era. Many problems face them, but they look optimistically toward the future. One reason for this optimism is the assistance that has been and will, no doubt, continue to be forthcoming from private industry and research institutions.

Such assistance may be procured in various ways. DATA readers with a product they think might be useful may arrange to exhibit or demonstate it at the Laboratories by telephoning Technical Liaison Office of ERDL at SOuth 5-7700, Ext. 34136, or by writing to that office. Industries or research institutions desiring to investigate possibilities of contract work with the Laboratories are welcome to write, or visit at any time.

Located on historic Belvoir peninsula, 15 miles south of the nation's capital, the Laboratories are predominantly a civilian organization. Some 1400 civilians, supplemented by 250 officers and enlisted men make up the work force.

They are engaged in 17 fields of endeavor, namely: bridging and stream crossing, buildings, construction and maintenance equipment, cover and concealment, electrical equipment, firefighting, general engineering, industrial engines, industrial gases and equipment, infrared, liquid fuels distribution, mapping and geodesy, materials, mine warware and demolitions, processing and packaging, special weapons effects, and water supply and sanitation.

The general aim encompassing these fields is the development of rugged, mobile Engineer equipment capable of supporting fast moving battle groups of the new Pentomic Divisions in wide-ranging, dispersed operations required on the modern battlefield.

Below. Army's new floating bridge is light enough to be moved by air, strong enough to support heaviest tanks.

Equipment for Mobility

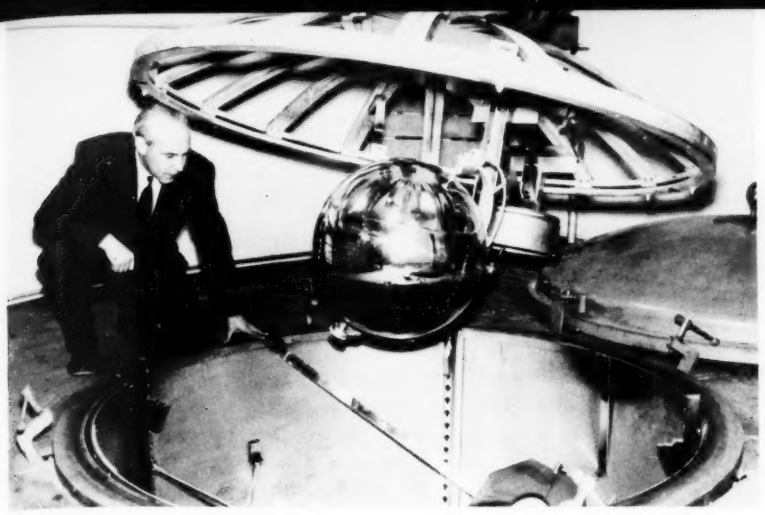
The primary mission of Corps of Engineers is to facilitate movement of friendly forces while impeding that of enemy. Some of the methods being developed by the Engineer Laboratories to increase this mobility are: providing more quickly emplaced tactical bridges; supplying troops with devices for night fighting; reducing threat of hostile minefields; and increasing output of road building and construction equipment.

For river crossings, emphasis is being placed on assault ferries, and improvement of boats and floating bridges. Means of speeding construction of both floating and fixed structures are also under study. Here, the helicopter has shown much promise.

For a moving Army, assault bridges must be placed, picked up and moved in rapid fashion. Studies are underway to improve recently developed "scissoring" bridge, which is considered an interim solution to problem.

Newly developed infrared devices will offer substantial assistance in making night operations for Atomic Army not only feasible, but effective. New models of sniperscope, metascope and binoculars are powerful, versatile, lightweight instruments that will give our troops capabilities far beyond those unaided. Infantry and armor units will be able to move and fight in total darkness, and Engineer troops will be able to effectively perform their role in the combat team. Also under development is an infrared device that takes pictures in total darkness.

To clear enemy minefields, a tank-mounted, nonexpendable roller that



Left. **VANGUARD satellite is coated at ERDL.**

Above. **Robot tractor is operated by radio from distances as much as 15 miles away.**

detonates pressure-activated mines has been developed.

For painstaking job of searching out individual "nuisance" mines, troops will welcome new transitor detector. Slated to replace small metal detectors used in Korea, it weighs only one-fourth as much and gives better performance. Maintenance, always a headache in the field, has been simplified to degree that operators can perform major repairs.

Construction equipment, methods and techniques are being developed to give our troops capability of building roads and airstrips in record-breaking times.

A family of air-dropable machines with production rates approaching those of their considerably heavier counterparts is now available. Looking ahead, a multi-purpose airborne machine is foreseen that will be ballastible at construction site to do work of a heavy tractor, scraper and prime mover.

High speed ditching machines have also been developed to provide quick excavations for personnel protection against flash burns and radioactive blast, and for underground storage facities. For early cleanup work in contaminated areas, there is a special lead cab to protect tractor operator, and a tractor under test that can be radio-operated from distances as far as 15 miles away.

On defensive side of mobility, a new machine that automatically plants mines at a rapid rate will help create barriers. Improved demolitions will also be instrumental in hindering the advance of enemy and canalizing his attack.

Equipment for Firepower

Keeping pace with rapidly advancing Army progress in the field of rockets and missiles has posed problems which cover full range of Engineer functions and activities. Only after an extensive array of support facilities has been made available can a missile leave the ground. Much support for Army's missiles is provided by Corps of Engineers.

The Redstone missile, for example, comes in three parts. Erecting the 70-foot missile on its specially oriented and leveled platform must be done with great care and accuracy, using a crane with a specially-developed 90-foot boom. Highly skilled Engineer troops operate the huge crane.

Ultra-cold liquid oxygen is used to burn the alcohol fuel. Since liquid oxygen is unstable and cannot be stored very long, generating plants must be relatively close to the launching site. Mobile plants that produce 5 and 20 tons of liquid oxygen a day are now in use, along with special trailers to haul it to missile.

Orienting and aiming the missile call for hairline precision and skillful calculation of trajectory. ERDL is constantly seeking better methods and equipment to help soldiers perform these tasks under battlefield conditions.

Power generation is also highly important to guided missile weapons systems. These systems need portable generator sets possessing the highest reliability, and electrical output characteristics of quality provided by a large central power station. All these features must be supplied in a compact, lightweight "package" that can be operated and maintained by field personnel. These packages range from a 50-pound kw generator to a 150 kw unit. A 60 kw generator is used by Redstone.

Other ERDL-developed items used with Redstone include a highly mobile aluminum fire truck, camouflage equipment, compressors, target location instruments and construction equipment.

Nuclear Power

The Army Package Power Reactor is located on ERDL grounds at Fort Belvoir. This is the prototype of a family of nuclear power plants under development for use at remote bases. Its components are transportable by air and capable of erection within a six-month period.

Plant went into service in April 1957 and is producing electricity at a rated capacity of 2,000 kilowatts. A similar plant with twice power level is being built in Alaska.

Another smaller plant, sized for application on a Dewline station, is under construction at National Reactor Test Station in Idaho. Both produce heat as well as electricity.

Succeeding plants of different sizes and types are in various stages of planning and development. They include a trailer-mounted plant, and one that will be mounted on a barge.

The use of atomic energy as a source of electric power and heat for military purposes is under development by Office of the Chief of Engineers and the Atomic Energy Commission.

The present objective is a family of transportable plants to meet the military requirements of all three services. The nuclear power program is important because virtually every technological advance in military equipment is accompanied by an increased requirement for electric power.

Truck-mounted earth auger can dig holes six feet in diameter 22 feet deep

AREAS OF RESEARCH

. . . AT ARMY ENGINEERING RESEARCH AND DEVELOPMENT LABORATORIES

Tank-mounted mine roller sets off mines ahead of vehicles

Inflatable assault boat makes river crossings easy

Infrared SNIPERSCOPE picks targets out of the night

Research at ERDL is broken down in 17 categories, which include many smaller facets of engineering. So diversified is the work at ERDL, that every DATA reader with a product to sell should find an out-let for it at the Fort Belvoir facility or its field laboratories.

SPECIAL WEAPONS EFFECTS

Since Engineer equipment must operate in any type of warfare, it is the job of the *Special Weapons Effects Branch* to investigate and test the effects of chemical, biological, and radiological warfare on Corps' material.

BRIDGING AND STREAM CROSSING

ERDL is constantly searching for new lightweight, mobile bridges, that can be laid down and picked up with great speed. New types of prefabricated highway and railway bridges are also studied by this branch of ERDL. Other types of bridging equipment observed by ERDL are floating military bridges, ferries, bridge accessories and protective devices, small boats, rafts, propulsion equipment, and diving gear.

FIREFIGHTING

One of the major problems facing ERDL today is developing necessary fire fighting equipment for all types of fire encountered in Army operations, including fires as a result of atomic attack. The *Fire Fighting Branch* designs, develops and tests new fire fighting equipment for all Army use, such as fire extinguishers, and special equipment for fuel storage fires, guided missile fires, and airplane crash fires.

LIQUID FUELS DISTRIBUTION

Mission of *Liquid Fuels Branch* is to select and develop equipment and techniques for installation and operation of the complete fuels distribution system from point of discharge from sea-going tankers to points where bulk fuel is placed in cans or drums. Two main problems faced in this field are:

1. *Means for rapid placement of tanker unloading facilities.*
2. *Methods of providing bulk storage other than above-ground storage, which obviously is almost an indefensible target.*

BUILDINGS

Building Branch is interested in designing, testing, modifying prefabricated buildings; special purpose structures; and heating, air conditioning, and electrical wiring harness for vans and prefabricated buildings for use in arctic temperature and tropical climates.

COVER AND CONCEALMENT

New concepts of warfare indicate increasing requirements for a camouflage. *Cover and Concealment* accomplishes twofold mission.

1. *Camouflage is required to provide concealment measures for our actual intended mission, so as*

to permit the quick, unimpeded movement necessary in mobile warfare.

2. *Camouflage provides deceptive measures to mislead enemy as to our actual deployment and intent.*

MINE WARFARE AND DEMOLITIONS

Mine Warfare and Demolition deals with the art of military engineering in demolitions. ERDL is interested in the behavior of high explosives and target materials during the detonation process, and the development of improved techniques for effective use of such explosives. In addition to the demolition phase, *Mine Warfare* is also interested in new concepts and principles which can be developed into equipment and techniques for minefield and other barrier passage and denial operations.

WATER SUPPLY AND SANITATION

Military water supply, waste disposal, and insect and rodent control all are encompassed in the field of *Water Supply and Sanitation*. ERDL wants to discover more systems of water purification, with particular regard to removal of chemical, biological, and radiological contaminants; dimineralization, ice and snow melting, distribution, drilling, and water storage methods and equipment.

CONSTRUCTION AND MAINTENANCE EQUIPMENT

Speed, mobility, and dispersion are the prime requisites in the field of *Army Construction and Maintenance Equipment*. ERDL wants to develop equipment with cross-country capabilities equal to that of the supported units. New construction and maintenance equipment must be built that have heavy-duty characteristics coupled with military capabilities.

INDUSTRIAL ENGINES

ERDL initiated a program in 1948 to standardize high mortality parts and accessories of large industrial engines, and also reduce the number of small engines needed, by the development of a military engine family. in the area of high mortality parts, which include pistons, rings, valves, and bearings, ERDL *Industrial Engine Development* has already reduced the number required to support gasoline engines within the 2 through 6 inch cylinder bore range from 2872 non-interchangeable parts to 207 standard parts.

INDUSTRIAL GASES AND EQUIPMENT

ERDL *Industrial Gas and Equipment* is developing a family of mobile trailer-mounted gas generated plants and storage-distribution equipment to meet field requirements. This includes acetylene for welding; hydrogen for weather observation balloons and other lighter-than-air requirements; gaseous oxygen for welding; medical and high altitude breathing uses; carbon dioxide for firefighting equipment; liquid oxygen for guided missile fueling, and nitrous oxide for anesthetic uses.

ELECTRICAL EQUIPMENT

Since an army must operate all over the globe, it must have electrical power units which can be easily transportable, dependable, and highly mobile. Primary interest in *Army Electrical Equipment* concerns generation, distribution, and transmission of electrical power. ERDL is searching for an easy method of converting nuclear energy into usable electricity.

INFRARED

To see and not to be seen is the objective of ERDL's *Infrared Development Program*. Several types of night vision equipment which allows weapon operator to see his target in darkness while not exposing himself have been developed by ERDL. The *Sniperscope*, a portable fighting device mounted on a rifle, which enables the rifleman to see a man-sized target 150 yards distant in total darkness, is just one of the many infrared devices developed by ERDL. Other developments, in the field of visible illumination, include tank-mounted searchlights, artificial moonlight mobile units, and high-intensity carbon arc searchlights.

MAPPING AND GEODESY

Research and Development in Geodesy and Mapping cover the development of equipment, material, and techniques for surveying for geodetic control, construction, artillery fire, and guided missiles; for the compilation of maps, photomaps, mosaics, and terrain models, and for their rapid reproduction. The new Army satellites will aid in making more accurate maps.

MATERIALS

The *Materials Branch* at ERDL is charged with the job of developing new materials to meet specific military requirements. Continuous, aggressive, supporting research in material needed for development of engineering equipment is also carried on by this branch, along with a limited program of basic research in material and aimed at producing new products, methods, and techniques of interest in engineering application. Investigations are currently underway on plastics, adhesives, protective coatings, rubbers, and other materials.

PROCESSING AND PACKAGING

It is the mission of the *Packaging Development Branch* to develop and test methods, techniques, and materials for protection of Engineer material from damage caused by corrosion and deterioration in storage and damage during shipment. Research and development is carried on in the fields of container design standards, processing equipment, marking and identification methods and materials, investigation and evaluation of processing material and techniques.

GENERAL ENGINEERING

The preparation of engineering design drawings of equipment and production drawings for the procurement of items, the preparation of specifications, and standardization studies of all tools and equipment comes under the heading of *General Engineering*.

Arctic Construction and Frost Effects Lab

Snow, Ice, and Permafrost Research Establishment

Beach Erosion Research

Mississippi River Dam #14, built by Army Engineers

OTHER ARMY ENGINEER

Waterways Experiment Station, Vicksburg, Mississippi

Acts as principal research, development and testing facility for Army Engineer Corps in scientific fields of hydraulics, concrete, soil mechanics, and flexible pavement design. WES assists in engineering planning and techniques essential to certain military functions. Vicksburg station supervises hydraulic model investigations for Engineers, and, directed by Chief of Engineers, investigates certain soils and concrete.

Snow, Ice, and Permafrost Research Establishment, Wilmette, Illinois

Conducts basic and applied research in the fields of snow, ice and frozen ground for DOD. Results of SIPRE's internal and external experiments are of great value in development of improved military operational capabilities in arctic and sub-arctic regions.

Arctic Construction and Frost Effects Laboratory, Boston, Massachusetts

Set-up to develop and improve engineering criteria for military construction in areas of both seasonal freezing and permanent frost. ACFEL studies, both in the field and lab, design and evaluate pavements placed on soils subject to seasonal frost action. Through cold room experiments, lab studies relative effects of variables that affect ice segregation in soils. Strength and bearing capacity of soils subject to freezing are tested at ACFEL with objective of establishing and improving designs for structure foundations and utilities in northern areas. Freeze and thaw penetration experiments dealing with soils are also carried on in labs. Boston laboratory is well equipped, with over 100 types and 250 pieces of investigation equipment.

Beach Erosion Board, Washington,, D. C.

Created in 1930, by River and Harbor Act in cooperation with State Agencies, BEB conducts studies to provide means of preventing erosion to shores of coastal and lake waters by waves and currents. Seven-man board, with complement of 100-person staff, determines most suitable method of protection, restoration and development of shores. Equipment at BEB includes experimental test tanks, test basin, analytical equipment, and instrumentation used in beach and wave studies. In addition to mobile and portable instruments used for field surveys and research sites, supporting facilities include photographic laboratory, sedimentological laboratory, and numerous equipment including amphibious vehicles for making complete near shore hydrographic surveys.

Ohio River Division Laboratories, Cincinnati, Ohio

Rigid Pavement Laboratory for Corps of Engineers studies development and criteria design of both rigid airfield pavements and pavement overlays. ORDL also serves

St. Anthony Falls Hydraulic Lab

RESEARCH ACTIVITIES

as a unit of Ohio River Division in support of both civil and military design and construction activities with appropriate responsibilities in the fields of soil and concrete foundation engineering.

St. Anthony Falls Hydraulic Laboratory, Minneapolis, Minnesota

Operated as part of University of Minnesota Hydraulic Laboratory has a three fold mission:

1. *Fundamental research in a broad field of fluid mechanics.*
2. *Applied research, involving largely experimental design and analysis of specific hydraulic structures.*
3. *Instruction and training of graduate students in hydraulics and fluid mechanics.*

Laboratory is unique in that it is designed to operate by diversion of water from Mississippi River above St. Anthony Falls. Water passes through lab and back to river below falls after having served purpose in experimental study of various types of hydraulic occurrences. Laboratory can handle flows from river as high as 150,000 gallons per minute.

Bonneville Hydraulic Laboratory, Bonneville, Oregon

Through use of small scale models, BHL assists Corps of Engineers in Pacific Northwest in navigation and flood control problems.

Los Angeles District Hydraulic Model Laboratory, Los Angeles, California

Tests and studies models designed to determine outstanding features of hydraulic structures, with special regard to high regard to high velocity flow. Three main types of models are tested:

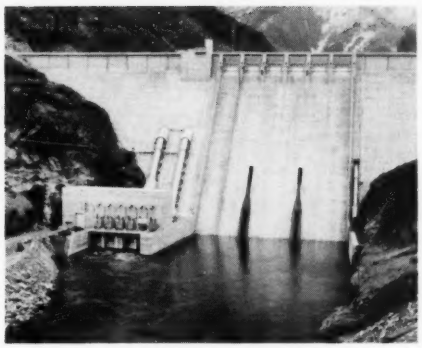
1. *Overflow and underflow structures, such as spillways and outlet works.*
2. *Transition structures, such as invert transitions in super-elevated channels and change in size or type of channel.*
3. *Energy dissipators, such as stilling basins.*

Rock Island District Paint Laboratory, Rock Island, Illinois

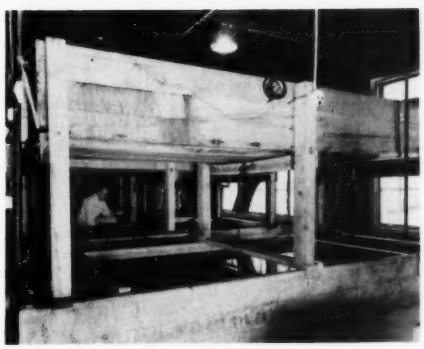
In addition to evaluating research data, equipment and material available from paint industry and other organizations, RIDPL acts as central agency for Army Engineer problems relating to paint and protective coatings. Paint laboratory also has task of investigating electrolytic means of corrosion mitigation for metal components of hydraulic structures.

Marine Division, Philadelphia District, Philadelphia, Pa.

Responsible for development and design of specialized floating plants such as derrick boats, booster pump barges, floating power plants, and concrete mattress sinking plants for river bank stabilization.

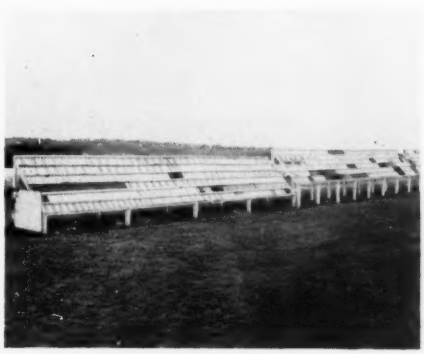


Bonneville Hydraulic Lab



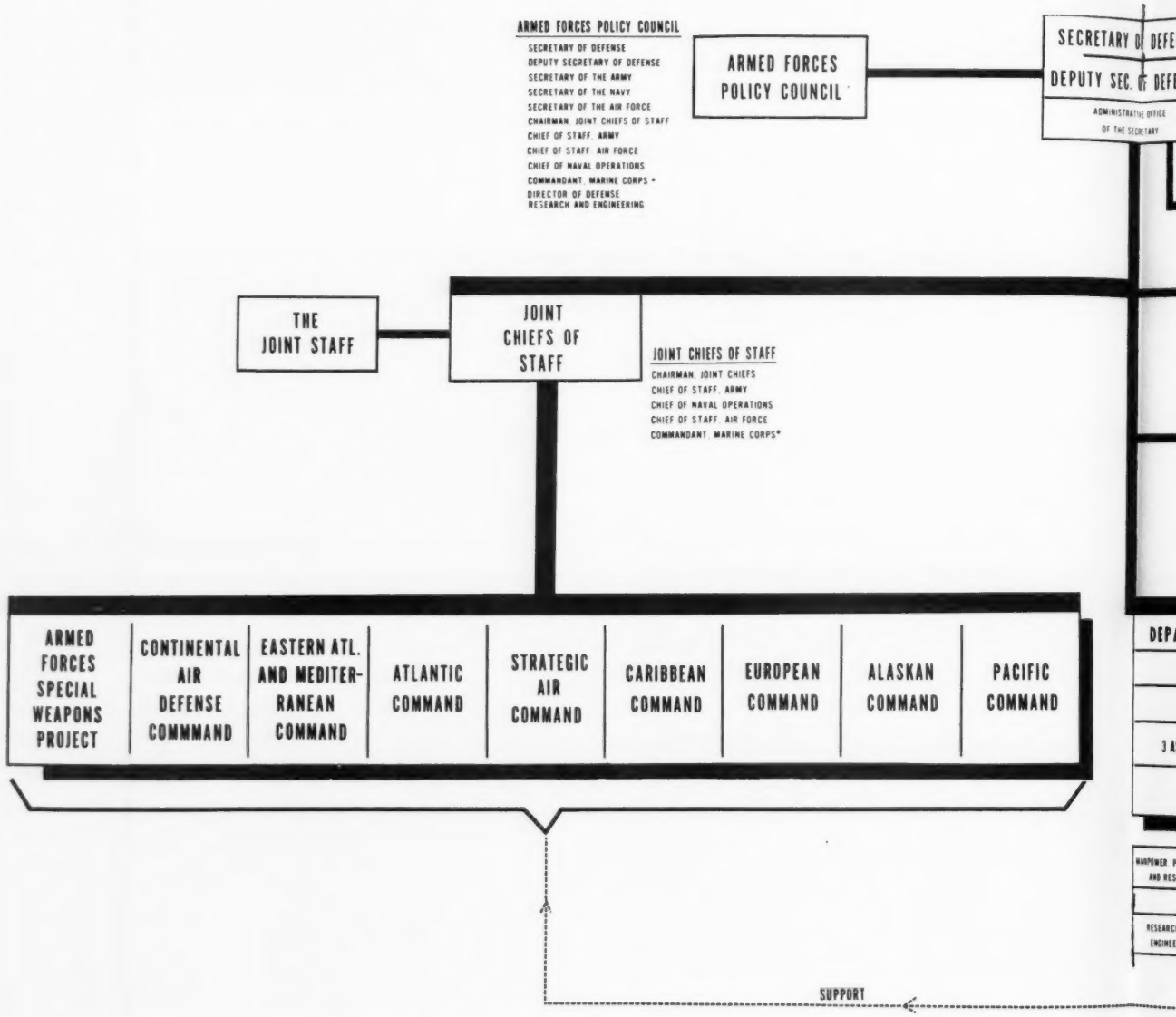
L. A. Hydraulic Model Lab

Rock Island Paint Lab



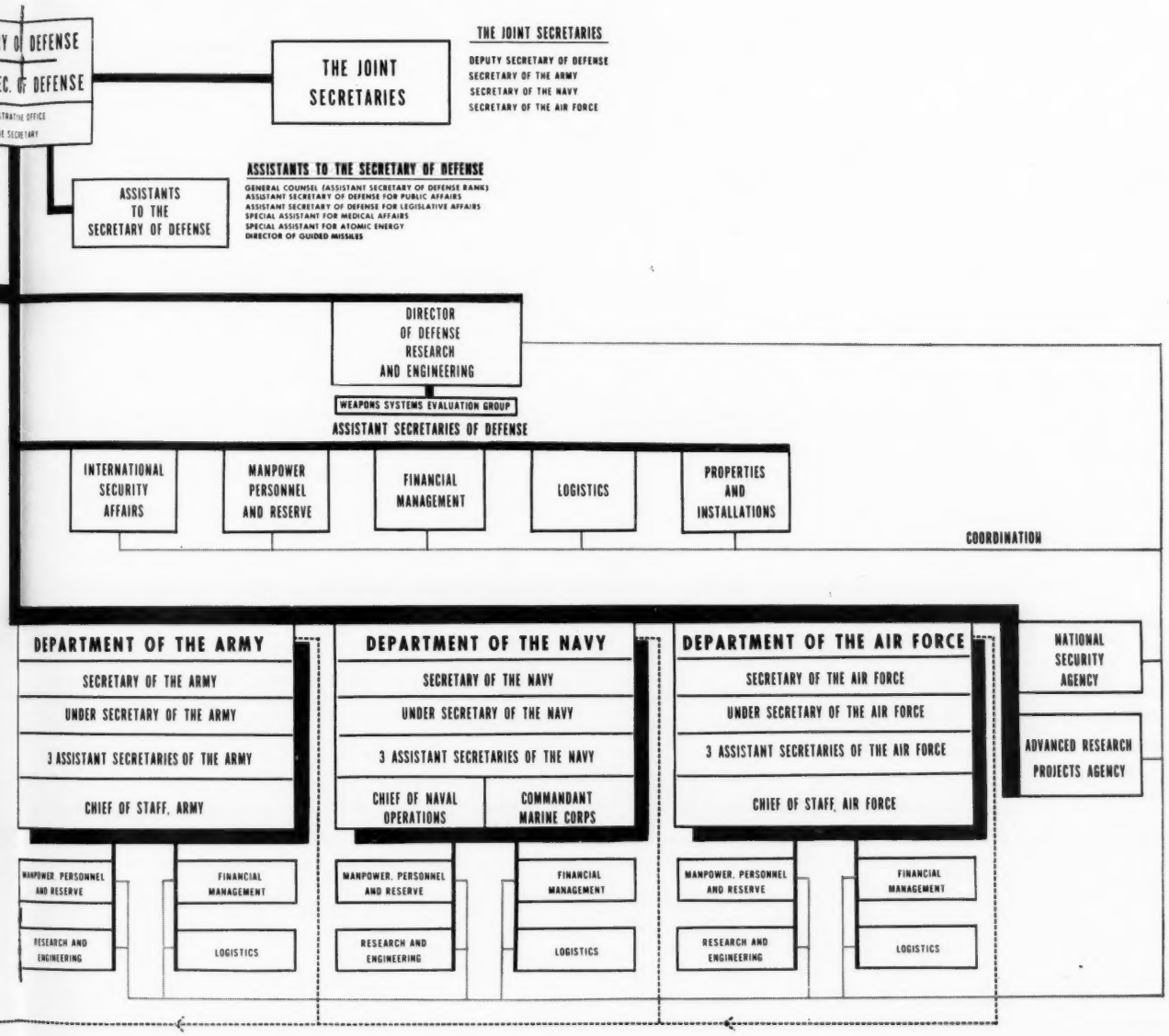
This is the official DOD Chart of the President's proposed reorganization.

THE DEPARTMENT



*WHEN PERTAINING TO MARINE CORPS MATTERS

ENT OF DEFENSE



BRIEFINGS

DOD DIRECTIVE 4200.10 OF MARCH 27, 1958

Subj: Department of Defense Policy and Responsibility in the Rapid Tax Amortization Program. WHAT IT DOES: Assigns responsibility for program of processing of applications for Certificates of Necessity, with regard to Rapid Tax Amortization. Asst SecDef (Supply & Logistics) will be responsibile for administration of RTAP within DOD. This includes establishment of policy on use of RTA as an incentive to private industrial expansion. 804.

DOD DIRECTIVE 4005.14 OF MARCH 27, 1958

Subj: Planning for Government Owned Industrial Facilities and Production Equipment. WHAT IT DOES: Establishes a policy whereby government owned industrial facilities and production equipment shall be planned, and supported only to the extent that the industrial base shall not exceed that needed to support, on most efficient and economical basis, combat readiness of U. S. military forces. 805.

DOD DIRECTIVE 5126.20 OF MARCH 25, 1958

Subj: Joint Department of Defense Committee for Standardization in the Area of Guided Missile Weapon Systems. WHAT IT DOES: Establishes Joint DOD Committee to continue work formerly assigned to the Task Group on Guided Missiles. Committee will develop and recommend for approval of Asst SecDef (Supply & Logistics), plans for accomplishing and maintaining standardization within area of guided missile weapon systems. 806.

DOD DIRECTIVE 3224.1 OF MARCH 25, 1958

Subj: Department of Defense Engineering for Transportability Program. WHAT IT DOES: Assures that items of military materiel and equipment are so designed, engineered and constructed that the required quantities for military use can be efficiently transported by available modes of transportation. Equipment to be developed or procured by military departments shall be of such gross weight and have such outside dimensions as will permit ready handling and movement by available transportation systems. 807.

DOD DIRECTIVE 4215.13 OF MARCH 21, 1958

Subj: Leasing of Government Owned Production Equipment. WHAT IT DOES: States that DOD owned or controlled production equipment shall not be made available for non-defense production except when such utilization has been approved by Office of Defense Mobilization. 808.

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Operational Requirements

Operational Requirements are expressed military needs which come from more than one isolated source. An Operational Requirement may or may not become an advertised or negotiated bid dependent upon the strength of the need and the feasibility of manufacture as determined by technical review officers. Sources for more information on the needs listed below are furnished on request. Write DATA, Dupont Circle Building, Washington 6, D. C.

AREAS IN WHICH A MAJOR 'SCIENTIFIC BREAK-THROUGH' IS SOUGHT TO SPEED RESEARCH AND DEVELOPMENT IN THE CORPS OF ENGINEERS:

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- **WIRELESS** transfer of **ELECTRIC POWER.**
- Major improvement in **FUEL OR ENGINE (OR BOTH)** so that fuel consumption (both gasoline and diesel) will be less than half the present consumption.
- Major improvement in **GAS TURBINE FUEL ECONOMY** (this might make the gas turbine useful for many military applications).
- Better ways of **HANDLING, TRANSPORTING AND STORING PETROLEUM FUELS** in atomic war.
- **RAIN MAKING** for control of atomic fires.
- Rapid means of **SOLIDIFYING SOILS** for roads and airfields, thus doing away with the requirement for paving.
- Means of **CONTROLLING DUST** on airfields, roads, missile launching sites, etc.
- New ways of **RAPIDLY MOVING LARGE QUANTITIES OF EARTH** with less machinery and fuel.
- Means of determining **LOCATION OF MINED AREAS FROM THE AIR** or at long slant ranges.
- Means of **DETECTING EXPLOSIVES AS SUCH,** as contrasted with soil anomalies.
- New methods of **CROSSING BARRIERS,** such as rivers and minefields.
- New methods of **CAMOUFLAGE AND DECEPTION.**
- Method of **EFFICIENTLY AND RAPIDLY PRODUCING LIQUID OXYGEN** from the air or other sources.
- More rapid means of establishing **GEODETIC CONTROL** for mapping thousands of miles within enemy territory.

* * *

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SPECIAL REPORT

AFOSR ASTRONAUTICS SYMPOSIUM, APRIL 28-30

Murray Queen Smith, Editor

With several other correspondents I was flown to Denver as guest of A. F. Office of Scientific Research to attend the Second Annual AFOSR Astronautics Symposium, April 28-30.

In DATA I have summed up the two days of speeches for you in three words:

moon dust and *conservatism.*

A year ago I attended the first AFOSR space symposium which was held in San Diego with Convair as cosponsor. Compared to first astronautics sessions, the Denver meetings were dull. This year's turn-out brought very few "heavyweights." At last year's symposium specialists were: Schriever, von Karman, Stuhlinger, Dempsey, Ehricke, Strughold. Not one attended these sessions.

You felt "Big Brother" was making these people toe the line. Last year the boys were pretty far out. Last year you didn't have speculation classified. This year I felt you did. Everything is classified these days.

Also, it was like pulling teeth to get copies of the papers. Finally Mel White, pub info officer trucked in a Thermo-fax machine from Lowry AFB and I did get copies of the main papers and speeches.

What were the main speeches? Mostly the talks were cislunar. In contrast to Stuhlinger's talk last year on using photonic power to visit the galaxy, speakers at this session were more "down to earth."

Biggest controversy was whether or not there was dust on the moon and how much. Two Harvard professors took opposite views. Dr. Thomas Gold presented a paper entitled "How Much Dust on the Moon" which convincingly postulated that the lunar landscape was covered with thick layers of dust, a few hundred feet thick and more treacherous than quicksand. Gold's Harvard hobnober, Dr. Fred Whipple, thought his colleague was a bit loony on the subject and spicing his talk with such phrases as, "We might find gold under those moon rocks—spelled with a small 'g' of course." built up a case in his speech, "On the Lunar Dust Layer," that the moon was solid as a hard-packed sandy beach and safe as the Mercantile Trust.

Filled with contradictions from the intriguing counterpoint of Mssrs. Gold and Whipple, I returned to the press room and asked my AFOSR host, Mel White, what he thought we'd find on the moon. "Russians," he said thoughtfully.

* * *

(Turn to page 30 to order verbatim copies of scientific papers presented at the Second Annual AFOSR Astronautics Symposium.)

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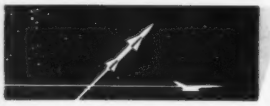


AIR/SPACE

NAVY UNVEILS AIRCRAFT UNDER-WING CONTAINER

capable of carrying double-barreled 20 mm automatic cannon with eight times the firing rate of its World War II counterparts. Container can be attached or detached in matter of seconds, and can be instantly jettisoned by pilot in flight. Developed by Hughes Tool Co., Culver City, California, and Naval Gun Factory, Wash., D. C., new gun, designated MARK II, has a firing rate of 4000 high-explosive rounds per minute.

X 748 (2) ///Pentagon OPI 0414/

DOD MAY ADD NEW MISSILE

called GANDER. An air-to-surface rocket, GANDER would contain little metal and would register virtually no return on enemy radar sets. Material for new missile may resemble fiber-glass used in GOOSE missile. Idea of rocket was proposed by Fairchild Engine and Airplane Corp., but no contracts of any kind have been awarded for its development. Both Navy and Air Force are interested in GANDER.

749 (1) ///Navy Times 0315-29/

AF HAS NEW LOW-LEVEL EJECTION PARACHUTE

developed by ARDC. New chute enables jet pilots to eject with perfect safety at low altitudes. Life-saving chute employs a quarter bag system, strengthened parachute bridle and main canopy, and automatic time delay release to slow pilot's fall prior to chute opening. Lower edge of canopy is scalloped to give pilot greater control over his descent.

750 (1) ///Nav Air News 04-29/

NUCLEAR ROCKET PROPULSION TESTS

may begin late this year at AEC's Nevada proving ground.

751 (1) ///Astronautics 03-10/

ARMY TESTING DOPPLER NAVIGATOR

in liaison planes. Developed by Ryan Aviation, Doppler self-contained system computes automatically, plane's drift, ground speed, longitude and latitude, wind direction and velocity, distance and course to pre-set destination.

752 (1) ///Army Information 0411/

COOK ELECTRIC RUSHING PRODUCTION OF "ASTRODOMES"

for use in tracking missiles, satellites, and future manned space vehicles. Built of re-enforced plastic, "ASTRODOMES" resemble 10-foot minature planetariums, including semi-spherical revolving roof, and dome that splits automatically to any specified opening. Finished "ASTRODOMES" will be shipped to White Sands Proving Ground for AF tests.

753 (1) ///Cook Electric 0316/

FOUR NAVY, MARINE AIR STATIONS WILL CLOSE

by end of March, 1959. Two major stations to be closed are NAS Atlantic City and MCAS Miami. In addition, NAAS Edenton, N. C., and Cabaniss Field, Corpus Christi, will be disestablished.

754 (1) ///Nav Av News 03-34/

AEROJET-GENERAL UNVEILS NEW AEROBEE 100

nicknamed "Junior." Capable of reaching altitudes of 60 miles, "Junior" was successfully fired only three months after its inception. Aerojet-General built new rocket as private venture to fulfill military needs for an inexpensive, medium performance, easy to operate missile.

755 (1) ///Aerojet Booster 03-3/

LOCKHEED GETS B-47 MODIFICATION CONTRACT

for fiscal year 1959. Contract calls for modernization, modification, cycle maintenance and inspection of 203 Boeing-designed B-47 medium bombers. First plane is scheduled to arrive at Lockheed's Georgia Division, July 1, 1958. 756 (1) ///AMC 0312/

$25 MILLION ARMY CONTRACT TO CHRYSLER

for further work on JUPITER missile. Work, which will be done at Sterling Township, Michigan, includes missile repair parts and component parts for training. X 757 (1) ///Pentagon OPI 0328/

PHILCO, G. E. GET SIDEWINDER CONTRACTS

totalling $25 million. Two contracts are to meet requirements of both Navy and Air Force for SIDEWINDER missiles.

X 758 (1) ///Pentagon OPI 0325/

MARTIN COMPANY TO BUILD PERSHING MISSILE SYSTEMS

for Army. Building program will involve several million dollars immediately and is expected to amount to multi-million dollar program over course of next five years. Work will be done at Martin's Orlando, Florida, Division. X 759 (1) ///Pentagon OPI 0325/

SEC DEF ANNOUNCES NEW SPACE PROGRAMS

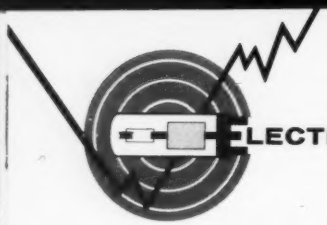
to include both scientific earth satellites and efforts to determine our capability of exploring space in vicinity of moon.

X 760 (2) ///Pentagon OPI 0327/

NEW ALL-WEATHER SURVEILLANCE SYSTEM USING SD-2 DRONE

announced by Army. New system will provide combat unit commanders with information regarding battle area. SD-2 drone, designed and developed by Rheem Manufacturing Co., Downey, California, is constructed mainly of laminated plastic for easy individual replacement.

X 761 (1) ///Pentagon OPI 0402/



ADDRESS BY LIEUTENANT GENERAL ARTHUR G. TRUDEAU

Chief of Army R & D, before Washington, D. C. Chapter, Armed Forces Communications and Electronics Association, on Tuesday April, 1958, at Washington's Willard Hotel. General Trudeau stressed role of communications in Army R & D program. New types of communication systems including trunk telephone dialing for battlefield use, were also mentioned by new R & D boss. X-762 (7) ///Pentagon OPI 0401/

TRANSMISSION OF PHYSIOLOGICAL DATA BY RADIO AND TELEPHONE

developed at Naval Medical Research Institute, National Naval Medical Center, Bethesda, Maryland. New system will permit such information as heartbeat, breath sound, spoken words and other measurements of physical condition of humans or animals, to be transmitted from isolated areas to NMRI. X-763 (1) ///Pentagon OPI 0422/

SPERRY GYROSCOPE GETS MISSILE GUIDANCE SYSTEMS CONTRACTS

totaling about $63 million. Sperry will produce major components of TALOS and TERRIER guided missile systems. Largest contract, amounting to nearly $59 million, is for production of Radar Systems AN/SPG-49 and Missile Guidance Radars AN/SPW-2, to be installed in TALOS guided missile ships. X-764 (2) ///Pentagon OPI 0327/

RCA GETS $5 MILLION FOR ELECTRONIC WORK

from Army. Contract was awarded to follow-up a major breakthrough in electronic miniaturization. Contract will involve work in micro-modules, which are tiny units having necessary electronic parts to make up stage or assembly of missiles. Use of modules will permit higher payloads, longer ranges, and smaller sizes in missiles.

765 (1) ///Wall St. Jrnl 0402-7/

WORK IS PROCEEDING ON 295-MILE MICROWAVE RELAY

and tropospheric scatter communications system being built by Philco's G & I Division for Air Force Eglin Gulf Test Range along Gulf of Mexico. Radio signals will be transmitted over horizon by reflecting signals off earth's troposphere. System will connect Eglin AFB at Panama City, Fla., to AF facilities at Tampa. Photos available.

766 (1) ///Philco 0413/

PILOT'S CAMERA RECORDS DATA

on North American Aviation's test flights. Weighing only eight pounds, camera unit, consisting of two 50-foot reels of 16mm motion picture film, is attached to helmet of test pilot, so that every phase of flight may be recorded. Shutter speed of one five-hundredths of a second makes it possible to print still photos of sufficient quality for research use, and also allows pilot, except in altitudes of high "G" loading, to photograph his own test instrumentation. "G" forces above four times gravity tend to make camera unwieldy. 767 (1) ///Nav Air News 03-14/

CAA ORDERS NEW RECORDED TIME SIGNAL

to increase efficiency of air traffic control operations. Voice time signals will be present in special recording machines which Civil Aeronautics Administration will soon put into use at all U. S. airports where traffic is controlled. Time signal will be announced and recorded along with vocal communications between aircraft and tower, so that exact time of all communications will be known and preserved.

768 (1) /// CAA 0402/

NAVY PLANNING TO ADD NEW DETECTION SYSTEM

to its destroyer fleet. New sonar with vastly improved ranges will be added to the Fleet in limited quantities in near future.

769 (3) DesLant Destroyerman 03-7/

SPERRY DEVELOPS FRICTIONLESS GYROSCOPE

so accurate that it allows missile to strike within 23 yards of target after flying 150 miles. Called Rotorace, new gyro, is said to be up to 60 times more accurate than previous gyros, and can be used in aircraft and ship navigation systems as well as missiles.

770 (1) ///Nav Air News 04-27/

ARMY SIGNAL DEPOTS GET EDP SYSTEMS

capable of handling 170,000 records and 2,000,000 pertinent facts. Electrical Data Processing Systems provide fast, efficient means for supplying Army's world-wide electronic needs.

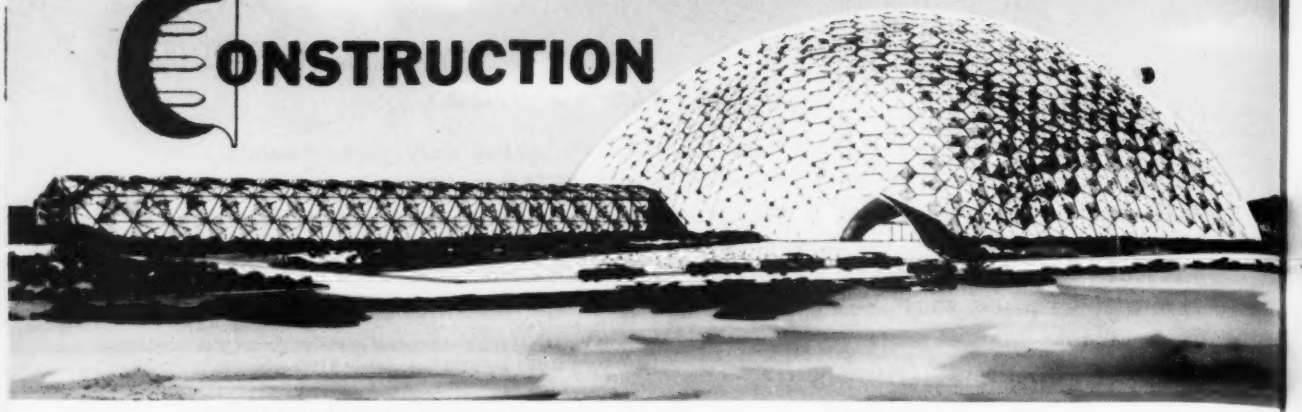
771 (1) ///Army Info Digest 03-45/

T. V. WEATHER BRIEFING

in use at Andrews AFB, Wash., D. C.. Developed by Dage Television Division, Thompson Products, "Weather Vision" uses closed circuit T. V. and two-way communications system to provide round-the-clock weather briefings. System greatly reduces time pilots need to get ready for flights.

772 (1) ///Navy Times 0329-25/

CONSTRUCTION



***ARTIST'S CONCEPTION** of all-steel "Union Dome" — world's largest circular building without internal supports — which is being built in Baton Rouge, La., by Union Tank Car Company of Chicago. The 10-story high geodesic structure (at right) is 375 feet across its interior base and 116 feet high at its center. A special paint area (at left) is 200 feet long and 20 feet high. Cost of "Union Dome" and tank car repair facilities it will house is in excess of $1,000,000, considerably less than conventional car repair shop of this size. It is believed to be first major industrial use of a dome structure in this country. ///UTCC 0305/*

NEW RATE SET ON CAPEHART HOUSING CONTRACT AWARDS

by DOD. New rate for Capehart financing will be 4 1/4%, as opposed to rate of 4% which had been in effect since program began in August, 1955. Projects advertised after April 2, 1958, will be subject to new rate, as will project currently advertised at 4% for which bids have not yet been opened. X-773 (1) ///Pentagon OPI 0409/

AEC PLANS TO BUILD GAMMA FOOD IRRADIATOR IN CALIFORNIA

which will become part of projected Army Ionizing Radiation Center at Sharpe General Depot, Lathrop, California. Source of gamma facility's radiation will be approximately two million curies of radioactive Cobalt 60. AEC invites proposals from qualified engineering and construction concerns for design and construction of irradiator. Interested firms should communicate immediately with Commission's San Francisco Operations Office, 518 17th St., Oakland 12, Calif.. Proposals must be submitted before May 16, 1958. X-774 (2) ///Pentagon OPI 0411/

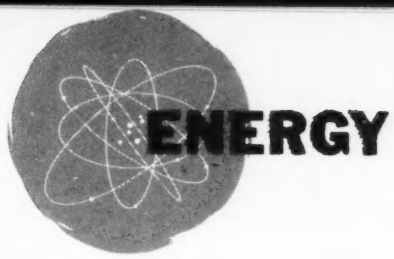
AF SPEEDS UP FAMILY HOUSING CONSTRUCTION

with 70,484 units scheduled over next two years. Nearly 10,000 units of this number already have been completed in program, which will cost in its entirety about $1 billion. X-775 (2) ///Pentagon OPI 0414/

$3.4 MILLION VOTED FOR COAST GUARD BUILDING

to house 5th Coast Guard District Headquarters, at Portsmouth, Virginia. House Appropriations Committee approved money for building, which will also contain a post office and other federal offices.

776 (1) ///Navy Times 0329-7/



PRICES OF FIVE RADIOSOTOPES REDUCED SHARPLY

due to establishment of new plant at Oak Ridge. New prices are generally less than 10 per cent of those formerly in effect for Cesium 137, Promethium 147, Cerium 144, Strontium 90 and Technetium 99.

777 (3) ///AEC 0411/

AEC PROPOSES TO ISSUE OPERATING LICENSE TO CURTISS-WRIGHT

for research reactor. Pool-type reactor will be constructed at Quehanna, Pennsylvania. 778 (1) ///AEC 0411/

DANGER AREA OF ENIWETOK PROVING GROUND PLACED OFF-LIMITS

to U. S. citizens and all other persons subject to jurisdiction of U. S., AEC has announced. Off-limits regulation applies until HARDTACK test series is completed. 779 (3) ///AEC 0411/

$250,000 CONTRACT FOR NUCLEAR REACTOR CONTROL CENTER

awarded to Leeds & Northrup Co., Philadelphia by National Advisory Committee for Aeronautics. Firm will build control center for nuclear reactor to be built at Plum Brook Ordnance Works, Sandusky, Ohio. Reactor will be used to study use of nuclear power for aircraft.

780 (1) ///Electronic News 0414/

HIGH FLUX REACTOR OPERATING AT OAK RIDGE

AEC reports. New reactor, designated "The Oak Ridge Research Reactor," will be used for fundamental research and engineering studies on effect of nuclear radiation on reactor materials, particularly fuel elements and structural materials. 781 (2) ///AEC 0324/

AEC TO ISSUE LICENSE FOR SEA DISPOSAL

of atomic waste materials to Isotopes Specialties Co., Burbank, California. Waste materials will be disposed of at sites selected by U. S. Coast Guard which are outside normal shipping lanes. License requires that material be disposed of in at least 1,000 fathoms of water.

782 (2) ///AEC 0308/

THE SOLID SCINTILLATION CHAMBER

Professor George T. Reynolds, an ONR contractor at Princeton University, has recently announced the successful testing of a preliminary model of new type of radiation detector that shows promise of becoming one of the most powerful tools of nuclear physicists. When fully developed, the instrument called a "solid scintillation chamber," will combine advantages of bubble chamber and scintillation crystal.

783 (1) ///ONR Research Reviews 02-21/

LOGISTICS : MATERIALS

ERDL DEVELOPS SPARK AND FLAME ARRESTING MUFFLER

designed primarily for gasoline engine powered fork-lift trucks used in congested and highly combustible areas. New device was built by Fluor Corp., Whittier, California. 784 (1) ///Army Info Digest 04-64/

AIRBORNE MAINTENANCE SHOP DEVELOPED BY ARMY ENGINEERS

to speed field repairs of Engineer equipment. 9000 pound unit will be mounted on standard military three-quarter ton truck, and can be air dropped into inaccessible areas. In addition to standard repair equipment, shop carries power package unit consisting of combination welding and power generator capable of producing seven kilowatts of three-phase electric power and 200 amperes of arc welding current.
785 (1) ///Army Info Digest 04-26/

NAVY SEEKS ANSWER TO CLOTHING PROBLEMS

of proposed dress white jumper, and dungaree shirt. Formerly worn by enlisted men prior to World War II, dress jumper has blue collar and cuffs, both with white stripes. Blue dye fades into white material when subjected to wear and tear of rugged shipboard laundries. In addition to no-fade dye, Navy wants new type of material for jumper, possibly a dacron-type cloth. Cloth must meet dye test before it is accepted. White jumper project has been halted until dye problem is solved. Uniform Board is also seeking a new "wash and wear" dungaree shirt. Shirt must look "dressy" without ironing. Interested manufacturers should write Uniform Board, Bureau of Supplies and Accounts, Main Navy, Bldg., Washington 25, D. C. 786 (1) ///Navy Times 0322-1/

PRESERVATION, PACKAGING, & PACKING MANUAL OUT

A comprehensive, up-to-date manual, "Preservation, Packaging and Packing of Military Supplies and Equipment" (NavEXOS P-938), is now being used by Navy field activities as a guide to preparing material for safe transportation to any part of the world under all kinds of conditions.
787 (1) ///BuSandA Newsletter 02-271

NAVY ORDERS SAFETY SHOES

for workers engaged in certain trades and occupations. Protective footwear, which will be worn by civilian and Naval personnel engaged in construction, materials handling, maintenance, transportation, and stevedoring, etc., includes toe guards worn over regular shoes, and safety shoes with built-in protective box toe. 788 (1) ///Navy Times 0329/

ORDNANCE

NAVY STUDYING UNDERWATER-TO-AIR MISSILE

named SUBROC, for use against enemy submarines. New weapon can be fired from conventional 21-inch torpedo tubes of present fleet submarines. SUBROC, although still in the secret stage, is expected to be adaptable to underwater-to-air-to-surface, or underwater-to-air use. It may also be used as an anti-missile weapon. SUBROC can carry either conventional or nuclear warheads. 789 (1) ///Navy Times 0412-4/

ARMY CHEMICAL WARFARE ALARM USES INFRA-RED

for detection of contaminants. Known as LOPAIR (long-path infra-red), device will flash warning and sound a horn when slightest amount of contamination is present. LOPAIR can detect contaminants that are colorless and invisible to naked eye. Device, which works on principal of reflected beams, can also be used for air pollution studies.
X 790 (2) ///Pentagon OPI 0404/

ROCKETDYNE BUILDING ROCKET SLED

that will travel faster than a bullet fired from low-powered rifle. Seven-ton sled is designed to travel 1,700 miles per hour. Power for aluminum vehicle designated RS-2, will come from liquid-propellant engine developing 16,000 pounds of thrust. 791 (2) ///NAA 0313/

MC MAY ADOPT NEW RIFLE, MACHINE GUN USED BY ARMY

if current tests prove successful. M-14 rifle and M-60 machine gun are being studied at Quantico, Va., and Camp Matthews, California. M-14 would replace M-1, BAR, carbine, and sub-machine gun, while M-60 will take place of two .30 caliber machine guns. 792 (2) ///Navy Times 0308-35/

ERDL DEVELOPS LIGHTWEIGHT COMPACT SUN COMPASS

for land navigation at all north or south latitudes. Clock mechanism in compass permits mechanical tracking of sun or stars.
793 (1) ///Army Info Digest 05-62/

POLARIS MISSILE PROGRAM INCREASED $350 MILLION

through Congressional appropriations. $22 million will go for advanced research and development on POLARIS submarine weapon system, along with $31 million for purchase of facilities, test vehicles and missiles needed for project. Major portion of money, $295 million, will go for construction of three nuclear-powered subs to carry new missile.
794 (1) ///NOL Report 03-7/

1958 AFOSR ASTRONAUTICS SYMPOSIUM PAPERS

DATA is now retyping the Thermo-fax copies of the original speeches and is making limited numbers of multilithed reprints of the 13 main papers presented at this Second Annual AFOSR Astronautics Symposium held in Denver, April 28-30, 1958.

These verbatim copies of the presented papers will be furnished to DATA subscribers at a service charge of $2 per paper, postpaid, or all 15 listed items for $25. If you want these papers please place your orders as soon as possible as we will not stock a large number of this space flight material. Titles and speakers are given below:

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JUPITER SATELLITE PROGRAM

.....	2Astro-7	**(Jupiter Satellite Luncheon Address Apr. 29) —Man in Space**—W. H. Pickering, Dir. of Jet Propulsion Lab.

DEPARTURE, SPACE NAVIGATION AND RE-ENTRY (Apr. 29, 1958)

.....	2Astro-8	**The Launching of Space Vehicles by Air Breathing Lifting Stages**—Antonio Ferri, Head, Dept. of Aero. Engrg. & Appld. Mechs., Lewis Feldman, Proj. Scientist, and Walter Daskin, Sr. Scientist, Gruen Applied Science Lab., Inc.
.....	2Astro-9	**The Difference Between Satellite and Ballistic Missile Re-Entry Problems**—Frederick Riddell and J. D. Teare, Scientists of AVCO Mfg. Co.

THE EARTH'S MOON (Last Session of Speeches, Apr. 29, 1958)

.....	2Astro-10	**Scientific and Engineering Exploration of the Moon**—J. Barnes, Systems Corp. of America.
.....	2Astro-11	**How Much Dust on the Moon**—Thomas Gold, Harvard College Observatory.
.....	2Astro-12	**On the Lunar Dust Layer**—Fred L. Whipple, Dir. Smithsonian Astrophysical Observatory, Harvard Univ.
.....	2Astro-13	**Lunar Surface Features & Internal Development of the Moon**—G. P. Kuiper, Yerkes Observatory.
.....	1Astro-RL	**List of Registrants at 1957 Symposium** (1958 List will not be available).
.....	2Astro-P	Complete Program of 2nd AFOSR Astronautics Symposium.

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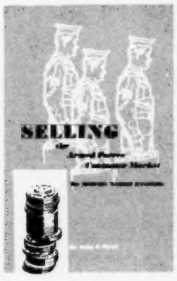

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John J. Ryan served as staff advisor to four Exchange Chiefs over a period of nine years. He attended high level meetings with military store representatives, personally visited several hundred service stores, and directed the first world-wide exchange conference. A well-known writer, Mr. Ryan's byline has appeared in over 100 of the nation's top newspapers and magazines. He is now employed as a Market Consultant and Special Features writer by the Army Times Publishing Company.

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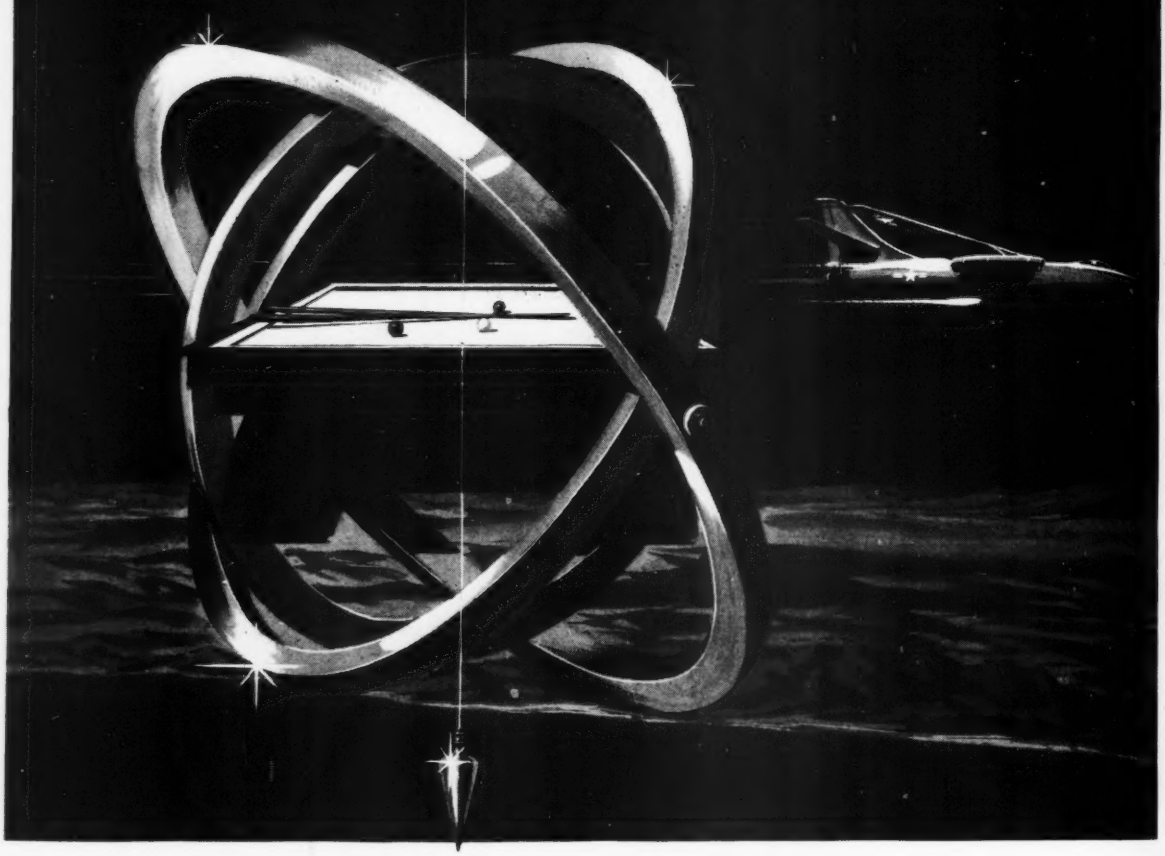

ADMIRAL'S PALO ALTO LABORATORY DEVELOPS EQUIPMENT FOR CAMERA STABILIZATION

The art of aerial photo-reconnaissance requires absolute camera stability to obtain the fine detail needed to discern small objects from great altitudes. Even with an automatic pilot in control, the plane itself is far too unstable for reconnaissance work, and additional stabilization is required.

Now Admiral has developed equipment that automatically compensates for the slightest deviations. Electronic signals from gyros are appropriately modified and distributed as needed to stabilize each of the various camera mounts. The accuracy of the gyro signals is fully reflected in the mechanical adjustments of each camera platform. Moreover, Admiral has applied subminiaturization techniques to reduce size and weight to half of the original requirement specifications.

This system was developed in Admiral's Palo Alto Laboratory by the Advanced Development Section, Government Laboratories Division. Complete information concerning the Laboratory's capabilities and current activities is available to qualified persons.

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ARMY DEVELOPS JET AGE PARATROOP SMOKE SCREEN

which for first time permits jet planes to lay down smoke curtain for concealment of paratroop jumps. Also, new tank used in laying screen produces cloud free from gaps and rifts common in other screens. Developed by Chem Warfare Labs, Army Chem Center, Md., new method of dispersion uses standard "FS" smoke compound. 809 (1) ///Pent OPI 0514/

SAGE SITE IS PLANNED

for Albuquerque, New Mexico. Funds for the site are dependent upon congressional approval of FY 1959 budget now before Congress. Budget contains an item of $6.8 million for Albuquerque facility.
810 (1) /// Pent OPI 0508/

NEW VEST UTILIZING BODY HEAT TO KEEP DRY CELL BATTERIES WARM

in extreme cold, developed by Army Signal Research and Development Laboratory, Fort Monmouth, N. J. New vest was designed to eliminate problem of batteries going dead in extremely cold weather.
811 (1) /// Pent OPI 0513/

WESTINGHOUSE GETS $17,905,000 NAVY CONTRACT

for nuclear-sub reactor components. Material called for in contract includes reactor vessels, control drive mechanisms, main coolings systems together with their generators and pumps and main loop piping. Westinghouse will purchase needed equipment from industry on competitive bid basis. X 812 (1) /// Pent OPI 0507/

$6 MILLION CONTRACT FOR PRODUCTION OF MIGHTY MITE

awarded to American Motors Corp. Named "Mighty Mite" because of its compactness, rugged construction and roadability, jeep-type vehicle will be used by Marine Corps. X 813 (1) /// Pent OPI 0505/

SECARMY APPROVES ADDITIONAL ORDER OF 900 M48A2

medium gun tanks at cost of $65 million. M48A2 tank is now in production by Chrysler Corp. under 1957 contract, and is being assembled at Lenape Ordnance Plant, Newark, Delaware. X 814 (1) /// Pent OPI 0505/

VANGUARD PROGRAM FACT SHEET

covers complete history of Vanguard program from its inception in 1955 up to launching and orbiting phase. Fact sheet lists prime contractors and principal subcontractors, in addition to info on Minitrack system.
X 815 (9) /// Pent OPI 0424/

REQUEST FOR MONEY TO BUILD 66 RESERVE FORCES FACILITIES

is received by Congress from Department of Defense. Total amount for facilities in 34 states, Hawaii and Puerto Rico, will be $30,140,000.

X 816 (5) /// Pent OPI 0505/

AF TO MODIFY B-47 AIRCRAFT

to increase plane's capability in certain low level tactics. While undergoing modification test will be made to determine status of structural components during low level operation. Structural failure may have been direct or contributing factor of recent B-47 accident.

X 817 (1) /// Pent OPI 0502/

NAVY TO LAUNCH USS INDEPENDENCE JUNE 6

at New York Naval Shipyard. New carrier is fourth of FORRESTAL-class aircraft carriers. Powered by 200,000 horsepower engines, INDEPENDENCE's speed reportedly will be in excess of 30 knots. Capable of carrying 100 high speed jet aircraft, new ship will utilize four steam catapults to launch 32 planes every four minutes. X 818 (1) /// Pent OPI 0424/

BUSINESS OPPORTUNITIES EXHIBIT SCHEDULED AT HUNTINGTON, W. Va.

June 17 - 19. Staged by Departments of Defense, Commerce, Post Office and Labor; General Services Administration, to assist labor surplus areas through displays of contract opportunities. Exhibit will have two-fold purpose - - to portray production, service, supply, or research and developments of a firm, and also to display items together with specifications which offer contract opportunities. An estimated 90 billion dollars of contract opportunities for businessmen will be represented at Exhibit by departments of Federal Government and private industry. 819 (1) /// Pent OPI 0512/

NAVY AWARDS $2 MILLION TO LOCKHEED FOR ASW ELECTRA

Special Anti-Sub Warfare version of Lockheed prop-jet ELECTRA has been chosen by Navy as faster, more protective, land-based antisubmarine bomber. Initial $2 million is for Lockheed R&D work re: Magnetic Air Detection equip and other ASW fittings. 820 (1) ///Pent OPI 0508/

AF TO REDUCE EUROPEAN SUPPLY AND MAINTENANCE FACILITIES

due to high cost of maintaining large overseas stockpiles. AF units in Europe will now order most of their supplies directly from AMC depots in this country. New type supply procedure has been made possible through improved communications, high speed transportation, and extensive use of maintenance contractor facilities in foreign countries.

821 (1) /// Pent OPI 0513/

JUNE ISSUE OF DATA MAGAZINE HIGHLIGHTS AIR RESEARCH DEVELOPMENT COMMAND. DON'T MISS IT. SOME AD SPACE STILL OPEN.

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